Claims

1. A video signal having data encoding a a visual image over successive frames each frame comprising scan lines of pixels, said video signal carrying data for optical detection via said image, wherein said visual image comprises at least one defined region and said optical data is encoded within scan lines within said defined region.

2. The video signal of claim 1, wherein said defined region is substantially rectangular.

3. The video signal of claim 1, wherein said defined region comprises a plurality of substantially rectangular regions.

4. The video signal of claim 2, wherein said data for optical detection comprises a plurality of messages, each message having its own predefined rectangle which persists over successive frames for the duration of the respective message.

5. The video signal of claim 1, wherein said data for optical detection comprises a message, and where said message is repeated cyclically over successive groups of frames.

6. The video signal of claim 5, wherein said data for optical detection comprises at least one position flag to indicate places in said cyclical repetition.

7. The video signal of claim 5, wherein said data for optical detection comprises a synchronization field to provide orientation within said cyclical repetition.

8. The video signal of claim 1, wherein said data for optical detection is arranged into a plurality of separate regions, thereby to increase message capacity.

9. The video signal of claim 1, further comprising an audible signal to indicate the beginning of said data for optical detection.

10. The video signal of claim 1, further comprising an audible signal to indicate the end of said data for optical detection.

11. The video signal of claim 9, further comprising a second audible signal to indicate the end of said data for optical detection.

12. The video signal of claim 1, wherein borders of said region are defined according to a required capacity of a message being carried by said data for optical detection.

13. The video signal of claim 1, in which said data for optical detection comprises a plurality of data symbols, and each symbol is encoded in at least one of said lines of said series.

14. The video signal of claim 1, in which said data for optical detection comprises a plurality of data symbols, and in which each data symbol is encoded in two of said lines of said series.

15. The video signal of claim 13, further comprising error correction encoding.

16. The video signal of claim 14, further comprising error correction encoding.

17. The video signal of claim 1, wherein said data for optical detection is superimposed, within said region, over an underlying image.

18. The video signal of claim 17, wherein said superimposing comprises blending with said underlying image.

19. The video signal of claim 2, wherein said rectangle is defined by a surrounding frame.

20. The video signal of claim 2, wherein said data for optical detection is modulated into said image by at least one of a group comprising black and white modulation, and color modulation,

21. The video signal of claim 2, wherein said data for optical detection is modulated into said image by at least one of a group comprising frequency shift keying, and quaternary frequency shift keying.

22. The video signal of claim 1, wherein said data for optical detection comprises at least one of a group comprising time information and program information.

23. The video signal of claim 1, wherein said data for optical detection comprises a software update for a decoding device.

24. Apparatus for encoding data for optical detection within the visual image of a video signal, the apparatus comprising:

a defining unit for defining a region within said image to carry said data for optical detection, and

an encoder, associated with said defining unit, for encoding said data for optical detection into video scan lines within said region.

25. Apparatus according to claim 24, wherein said region is retained over a succession of video images.

26. Apparatus according to claim 24, wherein said encoder is configured to superimpose said data for optical detection over an image, and wherein said superimposing is confined to said region.

27. Apparatus according to claim 26, wherein said superimposing comprises blending into said image.

28. Apparatus according to claim 27, wherein said blending comprises invisibly blending, such that said data for optical detection is substantially invisible to a user.

29. Apparatus according to claim 24, wherein said region is substantially rectangular.

30. Apparatus according to claim 24,, wherein said defined region comprises a plurality of substantially rectangular regions.

31. Apparatus according to claim 24, wherein said defining unit is configured to surround said region with a frame.

32. Apparatus according to claim 24, wherein said encoder is configured to encode said data for optical detection by at least one of a group comprising black and white modulation, and color modulation,

33. Apparatus according to claim 24, wherein said encoder is configured to encode said data for optical detection by at least one of a group comprising frequency shift keying and quaternary frequency shift keying.

34. Apparatus according to claim 24, wherein said data for optical detection comprises a print file configured for printing.

35. Apparatus according to claim 24, wherein said data for optical detection comprises barcode data.

36. Apparatus according to claim 24, wherein said data for optical detection comprises at least one of a group comprising time information and program information.

37. Apparatus according to claim 24, wherein said data for optical detection comprises a software update for a corresponding decoding device.

38. Apparatus according to claim 24, wherein said encoder is configured to insert said data as symbols, each symbol being encoded within at least one video scan line within said region.

39. Apparatus according to claim 24, wherein said encoder is configured to insert said data as symbols, each symbol being encoded within at least two video scan lines within said region.

40. Apparatus according to claim 24, wherein said encoder is configured to insert said data for optical detection in cyclical repetition.

41. Apparatus according to claim 40, wherein said data for optical detection comprises at least one position flag to indicate places in said cyclical repetition.

42. Apparatus according to claim 40, wherein said data for optical detection comprises a synchronization field to provide orientation within said cyclical repetition.

43. Apparatus for decoding data encoded optically within a defined region of a visual image of a video signal, said apparatus comprising:

an optical detector for optical detection of said image,

an encoded region determination unit for determining, from output of said optical detector, boundaries of said defined region within said scanned image, and

a data decoder associated with said encoded region determination unit for decoding data received at said optical detector that is determined to be within said defined region.

44. Apparatus for decoding according to claim 43, incorporated within a mobile device.

45. Apparatus for decoding according to claim 44, wherein said mobile device is a handheld device.

46. Apparatus for decoding according to claim 43, further comprising a printer associated with an output of said data decoder, for printing out decoded data.

47. Apparatus according to claim 46, wherein said data for optical detection comprises an identification flag and said printer is configured to make only a predetermined number of printouts per identification flag.

48. Apparatus according to claim 47, wherein said predetermined number is one.

49. Apparatus for decoding according to claim 44, wherein said mobile device comprises a mobile telephone.

50. Apparatus for decoding according to claim 43, comprising an accessory for a mobile telephone.

51. Apparatus for decoding according to claim 43, further comprising a software updater for using said decoded data for self-updating.

52. Apparatus for decoding according to claim 43, wherein said data for optical detection repeats cyclically and said decoder is operable to decode data whenever a substantially full cycle has been detected irrespective of where in said cyclical repetition said decoding starts at.

53. Apparatus for decoding according to claim 52, wherein said decoder is operable to use error correction data within said data for optical detection to deduce a starting point thereof.

54. Apparatus for decoding according to claim 43, wherein said data for optical detection comprises at least one position flag to indicate places in said cyclical repetition.

55. Apparatus for decoding according to claim 52, wherein said data for optical detection comprises a synchronization field to provide orientation within said cyclical repetition.

56. Apparatus for decoding according to claim 43, wherein said encoded region determination unit comprises an entropy summation unit for obtaining summations of entropy over a video image to identify said region as a region having maximal entropy.

57. Apparatus for decoding according to claim 56, wherein said entropy summation unit is configured to provide a sliding window to move over said image, to calculate an entropy summation for each window position and to identify said region as a window position having a maximal entropy.

58. Apparatus for decoding according to claim 57, wherein said encoded region determination unit is configured to provide relatively large changes in position of said sliding window between each entropy summation to provide coarse determination of said region.

59. Apparatus for decoding according to claim 58, wherein said encoded region determination unit is configured to provide perturbations to said coarse determination of said region to achieve fine determination of said region.

60. Apparatus for decoding according to claim 59, wherein said encoded region determination unit is configured to enable decoding of scan lines within a perturbation range around said region, so that data extracted therefrom can be used if said scan lines are subsequently determined to be within said region.

61. Apparatus according to claim 58, wherein said encoded region determination unit is configured to use a mean least squares (MLS) to achieve fine determination of said region.

62. Apparatus for decoding according to claim 56, wherein said entropy summation unit is configured to summate entropy over substantially all scan lines and all frequencies within said image.

63. Apparatus for decoding according to claim 43, wherein said encoded region determination unit is operable to continue to use a region as detected in previous frames of said image.

64. Apparatus for decoding according to claim 43, wherein said data for optical detection comprises symbols encoded as frequencies within said scan lines, said data decoder being operable to deduce said symbols from said frequencies.

65. Apparatus for decoding according to claim 43, wherein said data for optical detection comprises symbols encoded in a plurality of scan lines within said region.

66. Apparatus according to claim 65, wherein said data decoder is operable to sum a respective plurality of scan lines, and to decode a corresponding signal from said summation.

67. Apparatus for decoding according to claim 43, configured for scanning image produced by a plurality of video encoding methods, said apparatus being operable to scan for a first method, and if energy detected falls below a predetermined minimal threshold then to restart the scanning process.

68. Apparatus for decoding according to claim 43, configured for scanning image produced by a plurality of video encoding methods, said apparatus being operable to scan for a first method, and if energy detected falls below a predetermined minimal threshold then to scan for another one of said plurality of methods.

69. Apparatus for decoding according to claim 68, being configured to retain a last used video encoding method as a default method for initial scanning.

70. Apparatus for decoding according to claim 59, wherein said decoder is configured to correct data decoding according to subsequently carried out perturbations.

71. Decoding apparatus for decoding cyclically repeating data, said apparatus comprising:

a decoder for applying a decoding procedure to said data,

data handling logic for controlling said decoder and for outputting decoded data, and

a starting position recognizer associated with said decoder for using an output of said decoder to determine a start position of said data, said start position being used as a parameter for said data handling logic so as to ensure that said cyclically repeating data is decoded and output in a correct sequence from said start position.

72. Decoding apparatus according to claim 71, wherein said start position recognizer is configured to recognize a synchronization field within said cyclically repeating data.

73. Decoding apparatus according to claim 71, wherein said start position recognizer is an error correction circuit for operating with a cyclic redundancy code.